ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *National Instruments PXIe-2738* at our website: *Click HERE*

DEVICE SPECIFICATIONS

NI PXIe-2739

256-Crosspoint Relay Matrix

This document lists specifications for the NI PXIe-2739 (NI 2739) matrix relay card. All specifications are subject to change without notice. Visit *ni.com/manuals* for the most current specifications.

Topology.....2-wire 16 × 16 matrix

Contents

About These Specifications..... 1
Input Characteristics..... 2
RF Performance Characteristics.....3
Dynamic Characteristics..... 4
Physical Characteristics..... 4
Environment.....5
    Operating Environment.....5
    Storage Environment.....5
Shock and Vibration.....5
Diagrams..... 6
Accessories.....7
Derating NI 2739 Load at >40 °C.....8
    Module Load Derating at >40 °C.....8
Compliance and Certifications.....9
    Safety..... 9
    Electromagnetic Compatibility..... 9
    CE Compliance 10
    Online Product Certification..... 10
    Environmental Management..... 10

About These Specifications

Specifications characterize the warranted performance of the instrument under the stated operating conditions.

Typical Specifications are specifications met by the majority of the instrument under the stated operating conditions and are tested at 23 °C ambient temperature. Typical specifications are not warranted.

All voltages are specified in DC, AC_{pk}, or a combination unless otherwise specified.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Caution The protection provided by the NI 2739 can be impaired if it is used in a manner not described in this document.

Input Characteristics

Maximum switching voltage

Channel-to-channel.....100 V

Channel-to-ground.....100 V, CAT O

Note This module is rated for Measurement Category I. It is intended to carry signal voltages no greater than 70 V_{rms}, 100 V_{pk}, or 100 VDC. This module can withstand up to 500 V impulse voltage. Do not use this module for connection to signals or for measurements within Categories II, III, or IV. Do not connect to MAINS supply circuits (for example, wall outlets) of 115 VAC or 230 VAC.

Measurement Categories CAT I and CAT O (Other) are equivalent and are for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS voltage. This category is for measurement of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special hardware, limited-energy parts of hardware, circuits powered by regulated low-voltage sources, and electronics.

Caution When hazardous voltages (>42.4 V_{pk}/60 VDC) are present on any channel, safety low-voltage (≤42.4 V_{pk}/60 VDC) cannot be connected to any other channel.

Maximum switching power.....60 W, 62.5 VA

Caution The switching power is limited by the maximum switching current, the maximum voltage, and must not exceed 60 W, 62.5 VA.

Maximum current

Switching.....2 A (per channel)

Carry.....2 A (per channel)

Minimum switching load.....20 mV/1 mA

Note Switching inductive loads (for example, motors and solenoids) can produce high voltage transients in excess of the module's rated voltage. Without additional protection, these transients can interfere with module operation and impact relay life.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

For more information about transient suppression, visit *ni.com/info* and enter the Info Code `relayflyback`.

DC isolation resistance.....1 GΩ (typical at 25º C)
(channel-to-COM)

DC path resistance

Initial.....<1.3 Ω

End-of-life.....≥2.3 Ω

Path resistance is a combination of relay contact resistance and trace resistance. Measure path resistance by combining resistance of the high and low signal paths from one row to one column. Contact resistance typically remains low for the life of a relay. At the end of relay life, the contact resistance rises rapidly above ≥2.3 Ω.

Thermal EMF.....<10 µV

RF Performance Characteristics

Bandwidth (-3 dB, typical at 23º C)

1-wire 50 Ω termination.....≤ 10 MHz

2-wire 100 Ω termination.....≤ 10 MHz

Open channel isolation (typical at 23º C)
50 Ω termination

10 kHz.....≥ 77 dB

100 kHz.....≥ 62 dB

1 MHz.....≥ 42 dB

Channel-to-channel crosstalk (typical at 23º C,
50 Ω termination)

10 kHz.....≤ -70 dB

100 kHz.....≤ -52 dB

1 MHz.....≤ -32 dB

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Dynamic Characteristics

Relay Operate Time

- Typical.....1 ms
- Maximum.....3.3 ms

Simultaneous drive limit.....90 relays

Expected mechanical relay life.....1×10^8 cycles

Expected electrical relay life

- ≤30 mV, ≤10 mA resistive.....2.5×10^6 cycles
- 30 V, 1 A.....5×10^5 cycles
- 30 V, 2 A.....1×10^5 cycles
- 60 VDC, 1 ADC resistive.....1×10^5 cycles

Note Relays are field replaceable. Refer to the NI Switches Help at *ni.com/manuals* for more information about replacing a failed relay.

Note Certain applications may require additional time for proper settling. Refer to the NI Switches Help at *ni.com/manuals* for more information about including additional settling time.

Physical Characteristics

Relay type.....Electromechanical, non-latching

Relay contact material.....Palladium-ruthenium, gold covered

Front panel connector.....160 DIN 41612, 160 positions, male

Power requirement

- PXI Express
  - 12 V.....24 W
  - 3.3 V.....3.6 W

Dimensions (L × W × H).....3U, one slot, PXI/cPCI module, PXI Express compatible 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)

Weight.....423 g (14.9 oz)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Environment

Maximum altitude.....2,000 m (800 mbar) (at 25 °C ambient temperature)

Pollution Degree.....2

Indoor use only.

Operating Environment

Ambient temperature range.....0 °C to 55 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

Relative humidity range.....10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Related Information

Derating NI 2739 Load at >40 °C on page 8

Storage Environment

Ambient temperature range.....-40 °C to 71 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 limits.)

Relative humidity range.....5% to 95%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Shock and Vibration

Operating shock.....30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Meets MIL-PRF-28800F Class 2 limits.)

Random vibration

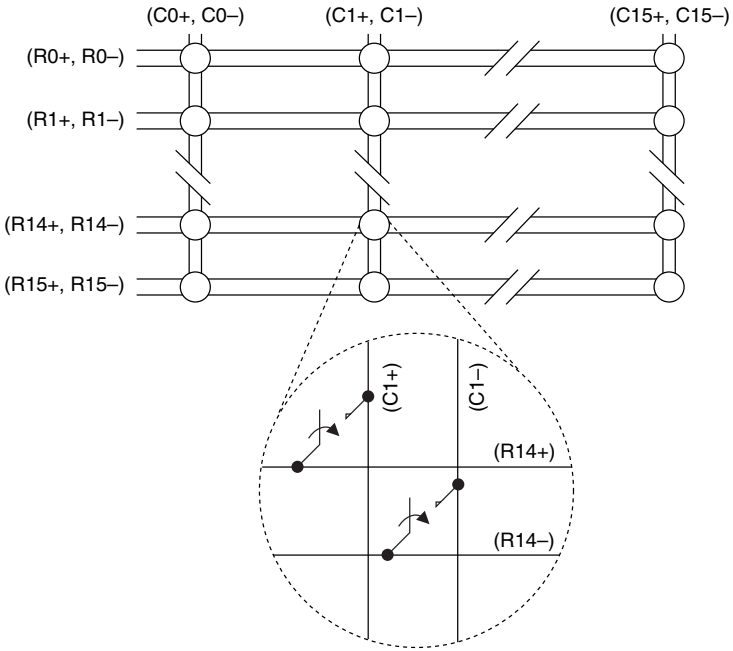
- Operating.....5 Hz to 500 Hz, 0.3 g_{rms}
- Nonoperating.....5 Hz to 500 Hz, 2.4 g_{rms} (Tested in accordance with IEC 60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Diagrams

The following figure shows the NI 2739 power-on state.

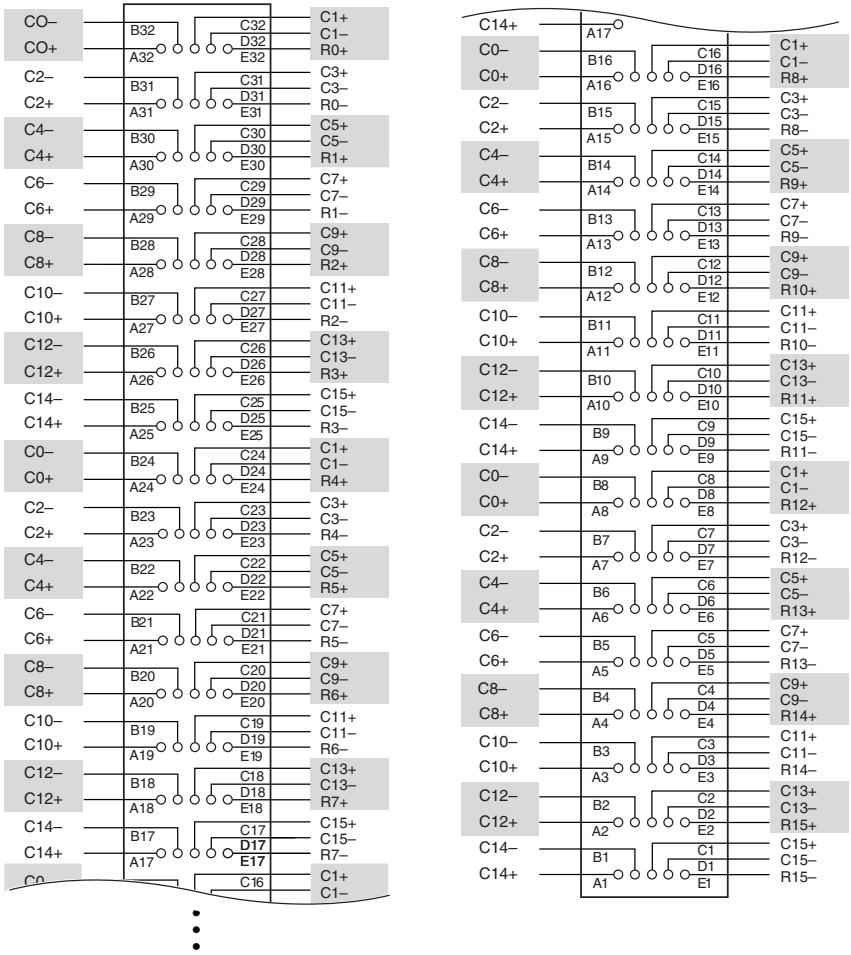
Figure 1. NI 2739 Power-On State



The following figure shows the NI 2739 connector pinout.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 2. NI 2739 Connector Pinout



Accessories

Table 1. NI Accessories for the NI 2739

Accessory	Part Number
DIN160 to 50-pin D-SUB switch cable, 1 m	782417-03
DIN160 to DIN160 switch cable, 1 m	782417-02

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 1. NI Accessories for the NI 2739 (Continued)

Accessory	Part Number
DIN160 to bare wire switch cable, 1 m	782417-01
Relay replacement kit for IM02PNS Relays	781089-10

Derating NI 2739 Load at >40 °C

To verify you are operating the NI 2739 within supported 2-wire derating conditions, complete the following steps:

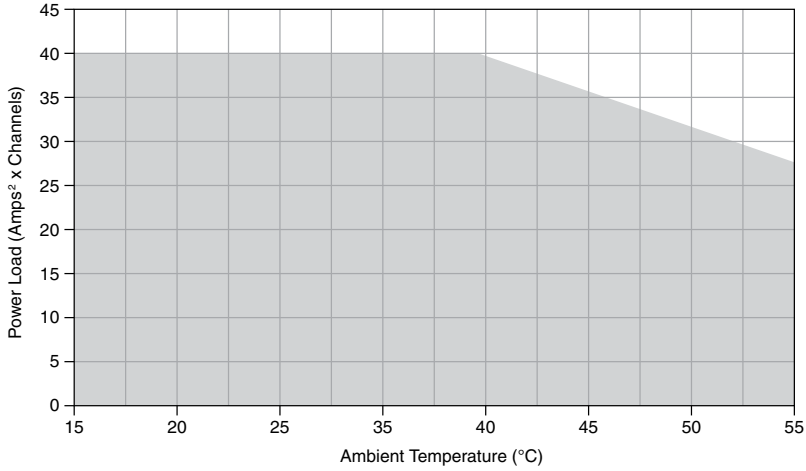
1. Use the following equation to calculate the load:

$$\text{Load} = \text{Channels}_1 \times \left(\text{Current}_1\right)^2 + \text{Channels}_2 \times \left(\text{Current}_2\right)^2 + \ldots + \text{Channels}_n \times \left(\text{Current}_n\right)^2$$

   where Channels is the number of channels that simultaneously carry a signal, Current, for 1, ... , *n*.

2. Verify that the load at your ambient operating temperature falls within the shaded region of the following figure.

Figure 3. NI 2739 Load Derating, 2-Wire



Module Load Derating at >40 °C

The following examples calculate supported derating conditions for the NI 2739.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Example 1

$$(3 \times 2^2) + (4 \times 1.7^2) = 23.6A^2 \times \text{channels}$$

where	3 channels carry 2 A
	4 channels carry 1.7 A

You can use this module at ambient temperatures between 0 °C and 55 °C.

Example 2

$$(8 \times 2^2) = 32A^2 \times \text{channels}$$

where	8 channels carry 2 A

You can use this module at ambient temperatures between 0 °C and 50 °C.

Compliance and Certifications

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia, and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations, certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit *ni.com/certification*, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

电子信息产品污染控制管理办法（中国 RoHS）



中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Refer to the *NI Trademarks and Logo Guidelines* at ni.com/trademarks for information on National Instruments trademarks. Other product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering National Instruments products/technology, refer to the appropriate location: **Help**»**Patents** in your software, the patents.txt file on your media, or the *National Instruments Patent Notice* at ni.com/patents. You can find information about end-user license agreements (EULAs) and third-party legal notices in the readme file for your NI product. Refer to the *Export Compliance Information* at ni.com/legal/export-compliance for the National Instruments global trade compliance policy and how to obtain relevant HTS codes, ECCNs, and other import/export data. NI MAKES NO EXPRESS OR IMPLIED WARRANTIES AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN AND SHALL NOT BE LIABLE FOR ANY ERRORS. U.S. Government Customers: The data contained in this manual was developed at private expense and is subject to the applicable limited rights and restricted data rights as set forth in FAR 52.227-14, DFAR 252.227-7014, and DFAR 252.227-7015.

© 2014 National Instruments. All rights reserved.

376203A-01 Dec14

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP